

Linking Climate to Multi-purpose Reservoir Management:  
Adaptive Capacity and Needs for Climate Information in the  
Gunnison Basin, Colorado

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Abstract

Across the Interior West, changing societal values and natural resource policies are creating increased demand for in-stream flows for environmental sustainability and for recreation. This dissertation focuses on the Gunnison River basin in western Colorado, and the management of the USBR Aspinall Unit, which is changing to meet the needs of the Upper Colorado River Recovery Implementation Plan for Endangered Fish, a federal reserved water right for the Black Canyon of the Gunnison National Park, while still meeting its original purposes including water for farming and ranching dating to the late 19<sup>th</sup> century. Reservoirs are a keystone of these critical water issues because in meeting their original goals they have changed the natural hydrograph and adversely affected ecosystems, but they also have the potential to be part of the solution for restoring these ecosystems. As reservoir managers seek to meet multiple and expanding purposes, water use and management is intensifying to meet water demands that were unforeseen in original water project planning. At the same time, two realities are becoming evident: an increasing sensitivity to climate variability because there is little buffer left in the system, and the interdependence of both water uses and users. With respect to climate variability, a decision analysis of current reservoir management synthesized with new demands finds that there are entry points for climate forecasts and information which might allow managers to plan for water allocation in dry periods or to take advantage of wet periods to satisfy more uses. However, climate forecasts and information are generally not available in a manner to be useable in this context. Given the interdependent and multi-agency nature of the water problems, institutions in the basin need the capacity to manage intensification and interdependence of water uses. Institutions in this basin have a high degree of adaptive capacity to cope with changing policies as well as to climate conditions. The conclusion considers the implications of the study for multi-purpose reservoir management in this and other basins, and implications for the development of climate services.